

NASA SBIR/STTR Technologies

S20.01-9000 - GNSS Reflectometer Instrument for Bi-static Synthetic Aperture Radar (GRIBSAR) measurements of earth science parameters

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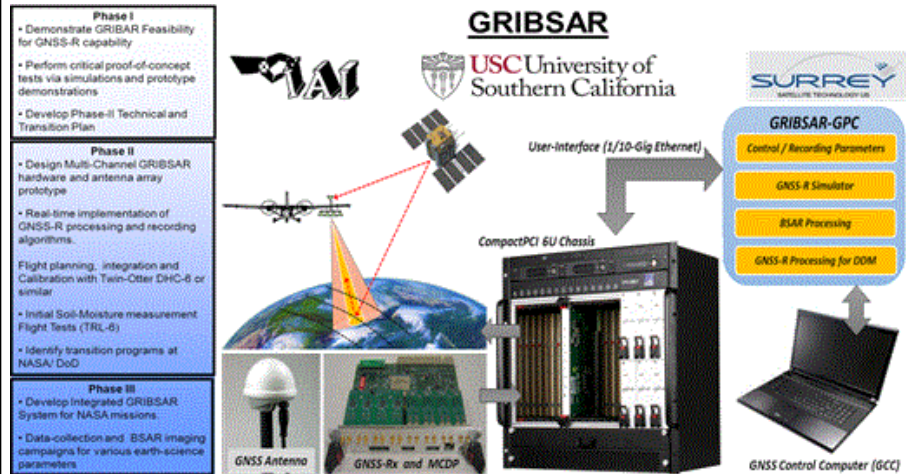
Identification and Significance of Innovation

GNSS signals scattered from ocean, land and ice are affected by the reflecting surface, and hence the changes induced by the surface can be observed. The full-time operation of radio navigation satellites system, abundant global signal coverage and spread spectrum communication for flexible signal processing makes GNSS reflected signals a viable candidate for Signal-Of-Opportunity (SOO) passive sensing. Existing research has shown that GNSS-Reflectometry (GNSS-R) based remote sensing has the potential to give environmental scientists a low-cost, wide-coverage measurement network that will greatly increase our knowledge of the Earth's environmental processes. The IAI team proposes to develop a GNSS Reflectometer Instrument for Bi-static Synthetic Aperture Radar (GRIBSAR) for measuring earth science parameters. Our proposed approach is modular, scalable and meets the NASA goals of multi-channel, GNSS-R system to exploit GNSS reflected signals as SOO.

Estimated TRL at beginning and end of contract: (Begin: 3 End: 4)

Technical Objectives and Work Plan

The Phase-I technical objectives are: Objective 1: Prove the feasibility of GRIBSAR system design for NASA Science Applications Objective 2: Demonstrate a path to flight integration and subsequent earth science measurement Objective 3: Develop the transition plan for Phase-II design, flight tests and commercialization



NASA Applications

GRIBSAR be used for a wide range of remote sensing applications for NASA including: Reconfigurable radar systems for UAVs and manned aircrafts Tomographic Radar for Biomass and Ice-sheet imaging. Algorithm development platform for existing NASA radar platforms

Non-NASA Applications

The most promising commercial applications of GRIBSAR, besides NASA applications are: Real-time digital processors Multi-channel GPS/GNSS Signal recorder and processing Passive direction-finding

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NON-PROPRIETARY DATA